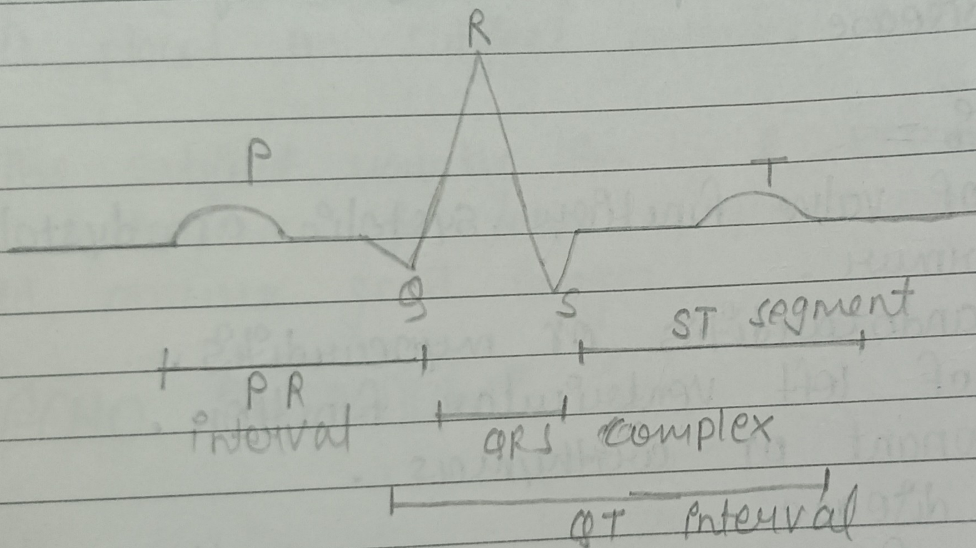
ECG

[Electro cardio Gram] -

ECG is a tenquine by which the electrical activity of the heart are studies.

electro cardio graph - This is the instrument while which the electrical activity of the heart are recorded.

electro cardio gram - This is record or graphical respresantation of the electrical activity of the heart.



* ECG leads :- An ECG machine use the information it collect by it's 4 limbs & 6 chest electrode.

1) RA [right arm] or wrist .-
2) LA [left arm].
3) LL (left leg]. lower.
4) RL right lower leg.
5) LL - left leg,

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B1 - 4th intercostal spase. - right sternal border
B2 - left 4th intercostal space - left sternal margin.
B3 - mid way b/w the b2 & b4.
B4 - appex beat [5th intercostal space - mid clavicular line]
B5 - ant. axillary line [left side] in straight with B4
B6 - mid axillary line straight line with B4 & B5.

* ECG Recordings :-
By convention the mean waves on the ECG are giving the names P, Q, R, S, T.

1. P wave - It is a (+)ve & 1st wave. & positive of ECG or long wave.
→ It is also cld atrial complex.
Causes :- (contract)
this is recorded due to e depolarization' of atrial musculture.
Durtion - ~~2-4~~ 0.1 sec.
amplitude - ~~to 1 se~~ 0.1 to 0.12 ms.

2. QRS complex :- This is also cld inital ventricular complex.
→ Q wave is small & negative wave.
→ R wave tall & positive.
→ S wave small / short or negative.
Causes :-
QRS complex is obtained because of the depolarization of ventricular musculture.
Duration - 0.08 to 0.12 sec.

amplitude - 0.1 to 0.0.2 mV
R wave - 1 mV.
S wave - 0.4 mV.

3) T wave :- It is final ventricular complex wave is (+)ve & tall wave.

causes -
1. ventricular muscular repolarization.
duration - .2 sec.
amp. - 0.3 mV.

4) PR interval :- It is the interval b/w the onset of 'P wave' & the onset of Q wave'
Significant :-
1) atrial depolarization & conduction of impulses through AV nodes.
duration - 0.18 sec.

5) QT interval :- This is the interval b/w the onset of 'Q wave' & the ~~onset~~ end of 'T wave'.
Significant -
- shows ventricular depolarization & ventricular re-polization.
duration 0.4 to 0.42 sec.

6) ST Segments - The time interval b/w & the end of S wave & the onset of T wave.
duration - 0.08 sec.

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~~EG~~ ECG changes in pathological conditions

Condition	ECG changes
acute MI	ST segment elevate.
MI ischemic	T inverted.
atrial fibrillation (cardiac muscle	P wave truly abs-ent.
right atrial enlarg-ement	tall P wave.
mitral walve disease	broad, or bifid. P wave.
ischemic heart disease.	prolonged PR interval.
left ventricular hypertrophy	deep Q wave.
right ventricular hypertropy	ST segment depression or P wave inversion.
pericardial effusion	Small T wave.
hyperkalemia (heart muscle ↑ Ca rise)	Shorter QT interval
hypocalcemia.	longer QT interval

VO_2 max. :- it is the highest O_2 uptake of an individual. at sea level the stroke volume become maximum at sub-maximum work load. when the VO_{2max} is 14% to 60%. (cardiac output)
after this stroke volume is stabilise & the cop is affected